

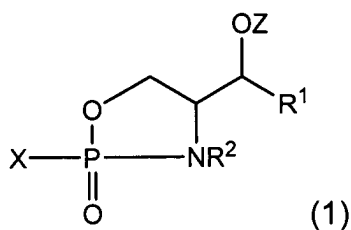
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. – 56. (Canceled)

57. (Currently amended) An oxazaphospholane compound of the following formula (1):



wherein R¹ represents a C₁-C₂₄ aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring, R² represents a hydrogen atom or hydrophobic group, Z represents a protecting group and X represents a leaving group.

58. (Currently amended) The oxazaphospholane compound of claim 57, wherein R² represents a hydrogen atom or a C₁-C₂₄ aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, said aliphatic chain optionally containing an aliphatic ring; the aliphatic chain and aliphatic ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur.

59. (Previously presented) The oxazaphospholane compound of claim 57, wherein R¹ represents a C₈-C₂₄ aliphatic moiety.

60. (Previously presented) The oxazaphospholane compound of claim 58, wherein R² represents a hydrogen atom or a saturated or unsaturated C₈-C₂₄ aliphatic moiety.

61. (Previously presented) The oxazaphospholane compound of claim 60, wherein R² represents a hydrogen atom.

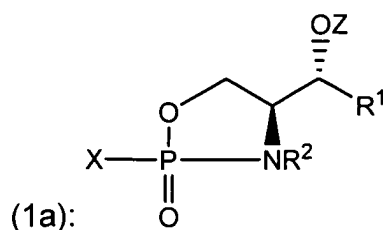
62. (Previously presented) The oxazaphospholane compound of claim 57, wherein X represents a halogen atom.

63. (Previously presented) The oxazaphospholane compound of claim 62, wherein X represents Cl.

64. (Currently amended) The oxazaphospholane compound of claim 57, wherein Z represents a Si(R⁵)₃ group in which R⁵ may be the same or different in the same compound and represents a C₁-C₆ branched or straight alkyl group or an aryl group.

65. (Currently amended) The oxazaphospholane compound of claim 64, wherein said Z represents Si(Ph)₂(t-Bu).

66. (Currently amended) An oxazaphospholane compound of the following formula

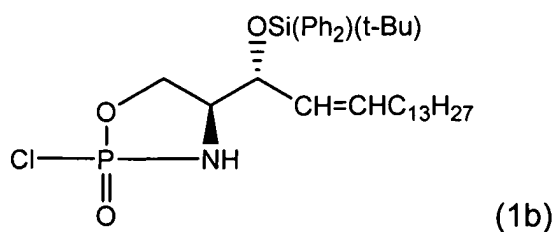


(1a) being the 2S,3R stereoisomer of the compound of claim 57, wherein R¹, R², X and Z are as defined in said Claim 57.

67. (Previously presented) The oxazaphospholane compound of claim 57, wherein R¹ is (E)-CH=CHC₁₃H₂₇, R² is hydrogen, X is Cl and Z is Si(Ph)₂(t-Bu).

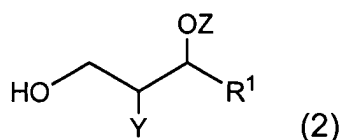
68. (Currently amended) The oxazaphospholane compound of claim 57, wherein R¹ is (E)-CH=CHC₁₃H₂₇, R² is hydrogen, and X is substituted with the group -O-CH₂-CH₂-N⁺(CH₃)₃.

69. (Currently amended) The oxazaphospholane compound of claim 57, being the (E)-geometrical isomer of the compound of the following formula (1b):



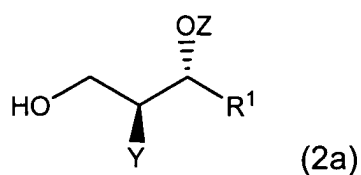
70. (Previously presented) The oxazaphospholane compound of claim 57, being an isolated stable compound.

71. (Currently amended) A process for the manufacture of an oxazaphospholane compound of formula (1) as defined in claim 57, the process comprises reacting a phosphorylating reagent with a 3-O-protected sphingoid compound of ~~the following~~ formula (2):



wherein R¹, Z and X are as defined in claim 57, and Y is an amine or an amino group.

72. (Currently amended) The process of claim 71, comprising reacting said the phosphorylating reagent with a 2S, 3R stereoisomer of ~~the following~~ formula (2a):



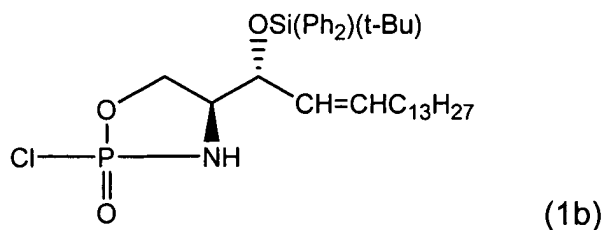
73. (Previously presented) The process of claim 71, wherein said phosphorylating reagent is reacted with the protected sphingoid compound in which Y represents NH₂.

74. (Previously presented) The process of claim 71, wherein said phosphorylating reagent is selected from POW₃, wherein W represents a halogen atom; an ethylene

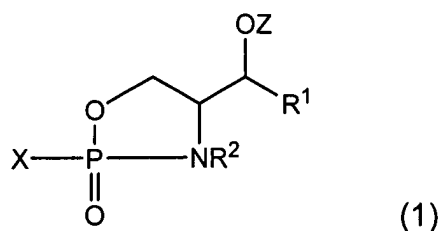
chlorophosphite; a methyl phosphodichloridite; a chloro-N,N-diisopropylaminomethoxophosphite; or $[(\text{isopropyl})_2\text{N}]_2\text{POCH}_2\text{CH}_2\text{CN}$.

75. (Previously presented) The process of claim 74, wherein said phosphorylating reagent is POCl_3 .

76. (Currently amended) The process of claim 71, for the synthesis of the (*E*)-geometrical isomer of the compound of the following formula (1b):

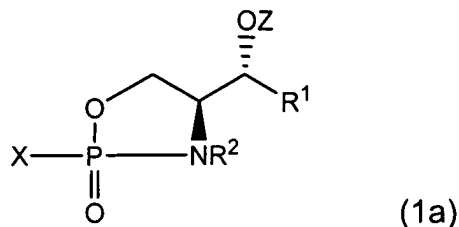


77. (Currently amended) An oxazaphospholane compound of the following formula (1):



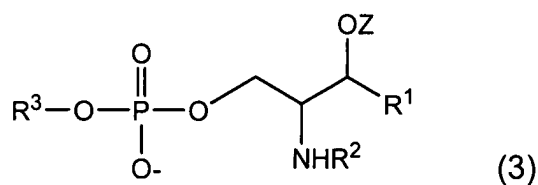
wherein R^1 represents a $\text{C}_1\text{-C}_{24}$ aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring, R^2 represents a hydrogen atom or hydrophobic group, Z represents a protecting group and X represents a leaving group, obtainable by the process of claim 71.

78. (Currently amended) An oxazaphospholane compound of the following formula (1a):



wherein R¹ represents a C₁-C₂₄ aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring, R² represents a hydrogen atom or hydrophobic group, Z represents a protecting group and X represents a leaving group, obtainable by the process of claim 71.

79. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, for the manufacture of an acyclic oxazaphospholane derivative having the following formula (3):



wherein R¹, R² and Z are as defined, and R³ represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated ring or an aryl group, said aliphatic chain may be branched or straight, saturated or unsaturated chain; or ether, polyether, or sugar moiety;

the process comprises the step of reacting said oxazaphospholane of formula

(1) with an alcohol or the formula R^3OH where R^3 is as defined, followed by treatment with an aqueous base or aqueous acid.

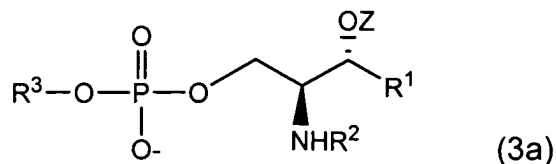
80. (Withdrawn) The process of claim 79, wherein said alcohol is selected from choline, N-protected ethanolamines, oligoethyleneglycol monoethers, polyethyleneglycol monoethers, polyethers, or sugar moiety.

81. (Withdrawn) The process of claim 80, wherein said alcohol is choline.

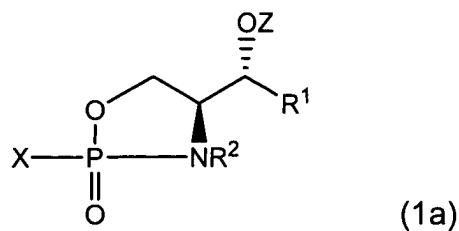
82. (Withdrawn) The process of claim 79, wherein said aqueous base is selected from trialkylamine, alkali metal- or alkali earth metal- hydroxide, carbonate or bicarbonate.

83. (Withdrawn) The process of claim 79, wherein said aqueous acid is a strong mineral acid or a Lewis acid.

84. (Withdrawn) The process of claim 79 for the manufacture of the 2S, 3R stereoisomer of formula (3a):



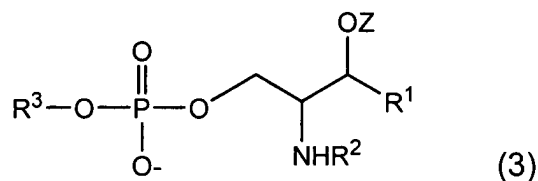
the process making use of a compound of formula (1a)



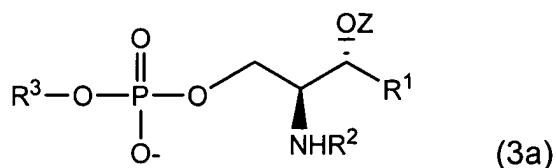
wherein R^1 , R^2 , R^3 , X and Z are as defined in claim 79.

85. (Withdrawn) The process of claim 79, comprising reacting said compound of formula (3) or (3a) with a protecting group removing reagent to replace the protecting group Z with a hydrogen atom.

86. (Withdrawn) A phosphate derivative having the following formula (3):



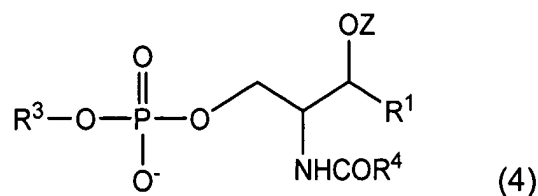
or its 2S, 3R stereoisomer of formula (3a):



obtained by the process of claim 79, wherein R^1 , R^2 , R^3 and Z are as defined in said claim 79.

87. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, wherein R^2 is a hydrogen atom, for the manufacture of a phosphate

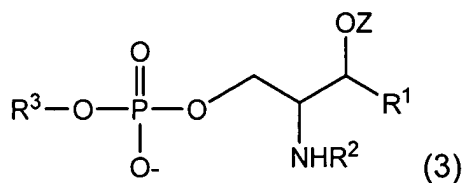
derivative having the following formula (4):



wherein R^1 , and Z are as defined, R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated or aromatic ring, said aliphatic chain may be branched or straight, saturated or unsaturated chain; or an ether, polyether, or sugar moiety; and R^4 is a hydrophobic group;

the process comprises

preparing a phosphate derivative of formula (3),



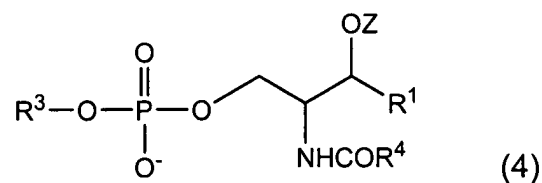
wherein R^1 , R^2 and Z are as defined, and R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated ring or an aryl group, said aliphatic chain may be branched or straight, a saturated or unsaturated chain; or ether, polyether, or a sugar moiety; and reacting said phosphate derivative of formula (3) with an acyl compound of formula $\text{R}^4\text{C}(\text{O})\text{Q}$, wherein Q is a leaving group.

88. (Withdrawn) The process of claim 87, wherein said R^4 represents a C_1 - C_{24} aliphatic moiety selected from saturated or unsaturated, branched or linear aliphatic chain, said aliphatic chain optionally containing an aliphatic ring; the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from oxygen, halogen, nitrogen and sulfur.

89. (Withdrawn) The process of claim 88, wherein said R^4 represents a saturated or unsaturated C_8 - C_{24} aliphatic chain.

90. (Withdrawn) The process of claim 87, for the manufacture of the 2S, 3R stereoisomer of the compound of formula (4), said process making use of the 2S, 3R stereoisomer of the compound of formula (1a).

91. (Withdrawn) A phosphate derivative having the following formula (4):

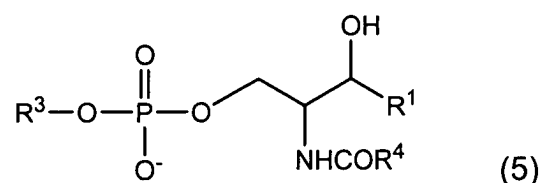


or its 2S, 3R stereoisomer;

obtained by the process of claim 86, wherein R^1 , R^3 , R^4 and Z are as defined.

92. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, wherein R^2 is a hydrogen atom, for the manufacture of a

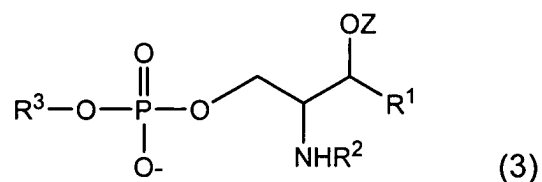
sphingomyelin derivative having the following formula (5):



where R^1 and R^3 are as defined, and R^4 is a hydrophobic group,

the process comprises:

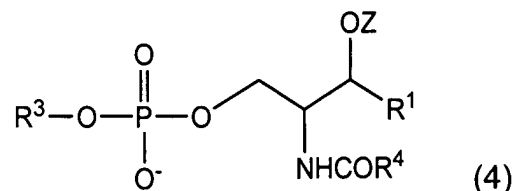
reacting said oxazaphospholane of formula (1) with an alcohol or the formula R^3OH where R^3 is as defined, followed by treatment with an aqueous base or aqueous acid to obtain a phosphate derivative having the following formula (3):



wherein R^1 , R^2 and Z are as defined, and R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated ring or an aryl group, said aliphatic chain may be branched or straight, a saturated or unsaturated chain; or ether, polyether, or a sugar moiety;

reacting said phosphate derivative of formula (3) with an acyl compound of formula $\text{R}^4\text{C(O)Q}$, wherein Q is a leaving group and R^4 represents a $\text{C}_1\text{-C}_{24}$ aliphatic moiety selected from saturated or unsaturated, branched or linear aliphatic chain, said aliphatic chain optionally containing an aliphatic ring; the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected

from oxygen, halogen, nitrogen and sulfur, to obtain a phosphate derivative of the following formula (4):



wherein R^1 , and Z are as defined, R^3 represent a hydrogen atom; an aliphatic moiety selected from aliphatic chain, amino aliphatic chain, heteroatom comprising aliphatic chain, aliphatic chain comprising a cyclic ring which ring may be saturated, partially saturated or aromatic ring, said aliphatic chain may be branched or straight, saturated or unsaturated chain; or an ether, polyether, or sugar moiety; and R^4 is a hydrophobic group; and

reacting said phosphate derivative of formula (4) with a protecting group removing agent to obtain a said sphingomyelin.

93. (Withdrawn) The process of claim 92, for the manufacture of the 2S, 3R stereoisomer of the compound of formula (5), said process making use of the 2S, 3R stereoisomer of the compound of formula (1a).

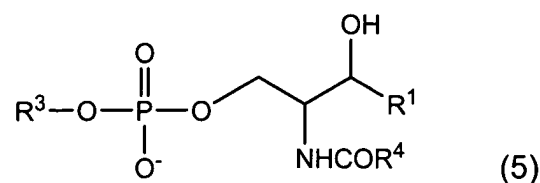
94. (Withdrawn) The process of claim 92, wherein Z in said compound of formula (4) is $\text{Si}(\text{Ph}_2)(\text{t-Bu})$.

95. (Withdrawn) The process of claim 92, wherein said protecting group is removed by

the use of hydrogen fluoride or $(R^6)_4NF$, wherein R^6 is a C_1 - C_6 alkyl group.

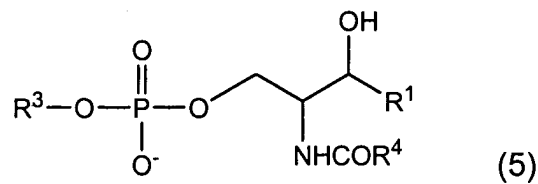
96. (Withdrawn) The process of claim 95, wherein R^6 is n-butyl.

97. (Withdrawn) A sphingomyelin having the following formula (5):



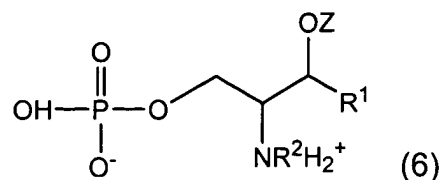
or its 2S, 3R stereoisomer obtainable by the process of claim 92, wherein said R^1 , R^3 and R^4 are as defined, provided that when said R^2 represents a C_{15} or C_{17} alkyl chain, R^1 cannot represent trans- $CH=CHC_{13}H_{27}$ and R^3 cannot represent $CH_2CH_2N^+(CH_3)_3$.

98. (Withdrawn) A sphingomyelin having the following formula (5):



or its 2S, 3R stereoisomer, obtained by the process of claim 92, wherein said R^1 , R^3 and R^4 are as defined in said claim 92.

99. (Withdrawn) A process making use of the oxazaphospholane of formula (1) as defined in claim 57, for the manufacture of a phosphate derivative having the following formula (6):



wherein R¹, R² and Z are as defined, the process comprises reacting said oxazaphospholane of formula (1) with an aqueous base or an aqueous acid.

100. (Withdrawn) The process of claim 99, for the manufacture of the 2S, 3R stereoisomer of the compound of formula (6), said process making use of the 2S, 3R stereoisomer of the compound of formula (1a).

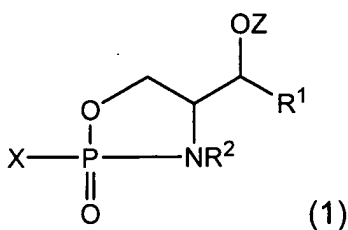
101. (Withdrawn) The process of claim 99, wherein said aqueous base is selected from trialkylamine, alkali metal- and alkali earth metal- hydroxide, carbonate or bicarbonate

102. (Withdrawn) The process of claim 99, wherein said aqueous acid is a strong mineral acid or a Lewis acid.

103. (Withdrawn) A phosphate derivative having the formula (6), or (6a) obtained by the process of claim 92.

104. (Withdrawn) A pharmaceutical composition comprising a sphingomyelin according to claim 97.

105. (New) An oxazaphospholane compound of formula (1):



wherein

R^1 represents a C_1 - C_{24} aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

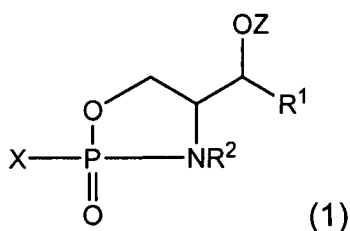
R^2 represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C_1 - C_{24} aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (t-boc), and $Si(R^5)_3$, wherein R^5 may be the same or different in the same moiety and is selected from a C_1 - C_6 branched or straight alkyl group or an optionally substituted aryl group; and

X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethoxophosphite, and $[(isopropyl)_2N]_2POCH_2CH_2CN$, wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an

ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.

106. (New) An oxazaphospholane compound of formula (1):



wherein

R¹ represents a C₁-C₂₄ aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

R² represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C₁-C₂₄ aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (*t*-boc), and Si(R⁵)₃, wherein R⁵ may be the same or different in the same

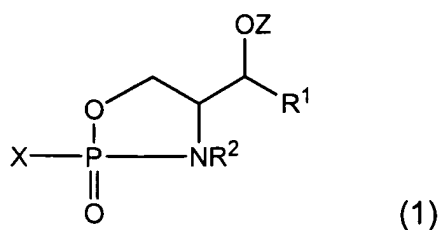
moiety and is selected from a C₁-C₆ branched or straight alkyl group or an optionally substituted aryl group; and

X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethoxophosphite, and [(isopropyl)₂N]₂POCH₂CH₂CN, wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain; and

provided R¹ represents a C₈-C₂₄ aliphatic moiety; or

Z represents a Si(R⁵)₃ group in which R⁵ may be the same or different in the same compound and represent a C₁-C₆ branched or straight alkyl group or an aryl group.

107. (New) An oxazaphospholane compound of formula (1):



obtainable by the process of claim 71, wherein

R^1 represents a C_1 - C_{24} aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

R^2 represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C_1 - C_{24} aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl carbamate (t-boc), and $Si(R^5)_3$, wherein R^5 may be the same or different in the same moiety and is selected from a C_1 - C_6 branched or straight alkyl group or an optionally substituted aryl group; and

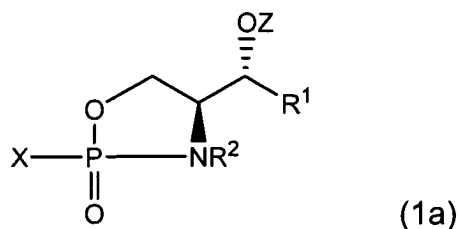
X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethoxophosphite, and $[(isopropyl)_2N]_2POCH_2CH_2CN$, wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.

108. (New) The oxazaphospholane compound according to claim 107,

wherein R^1 represents a C_8 - C_{24} aliphatic moiety; or

Z represents a $Si(R^5)_3$ group in which R^5 may be the same or different in the same compound and represents a C_1 - C_6 branched or straight alkyl group or an aryl group.

109. (New) An oxazaphospholane compound of formula (1a):



obtainable by the process of claim 71, wherein

R^1 represents a C_1 - C_{24} aliphatic moiety which may be a saturated or unsaturated, branched or linear chain, optionally containing an aliphatic ring;

R^2 represents a hydrogen atom or hydrophobic group, the hydrophobic group is a C_1 - C_{24} aliphatic moiety selected from a saturated or unsaturated, branched or linear aliphatic chain, the aliphatic chain optionally containing an aliphatic ring, the aliphatic chain or ring optionally substituted with one or more substituents containing a heteroatom selected from the group consisting of oxygen, halogen, nitrogen and sulfur;

Z represents a protecting group selected from the group consisting of methoxymethyl (MOM), tetrahydropyranyl (THP), diphenylmethyl, triethylsilyl (TES), *t*-butyldimethylsilyl (TBDMS), mesitoate, 9-fluorenylmethyl carbonate (f-moc), *t*-butyl

carbamate (t-boc), and $\text{Si}(\text{R}^5)_3$, wherein R^5 may be the same or different in the same moiety and is selected from a C_1 - C_6 branched or straight alkyl group or an optionally substituted aryl group; and

X represents a leaving group selected from the group consisting of a halogen atom, borate, ethylene chlorophosphite, methyl phosphodichloridite, chloro-N,N-diisopropylaminomethoxophosphite, and $[(\text{isopropyl})_2\text{N}]_2\text{POCH}_2\text{CH}_2\text{CN}$, wherein X is optionally substituted with a group selected from the group consisting of an alcohol, an ether, a polyether, and a sugar moiety, wherein the alcohol contains an aliphatic moiety selected from the group consisting of an aliphatic chain, an amino aliphatic chain, a heteroatom comprising an aliphatic chain, an aliphatic chain comprising a cyclic ring which ring may be saturated or partially saturated, and an aryl group, the aliphatic chain may be a branched or straight, saturated or unsaturated chain.

110. (New) The oxazaphospholane compound according to claim 109,

wherein R^1 represents a C_8 - C_{24} aliphatic moiety; or

Z represents a $\text{Si}(\text{R}^5)_3$ group in which R^5 may be the same or different in the same compound and represents a C_1 - C_6 branched or straight alkyl group or an aryl group.